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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/525,479

12/08/2005

Brian Warner

BAYE0001-101

7523

28524

7590

08/05/2008

SIEMENS CORPORATION
INTELLECTUAL PROPERTY DEPARTMENT
170 WOOD AVENUE SOUTH
ISELIN, NJ 08830

EXAMINER

MUMMERT, STEPHANIE KANE

ART UNIT

PAPER NUMBER

1637

MAIL DATE

DELIVERY MODE

08/05/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/525,479	Applicant(s) WARNER ET AL.	
	Examiner STEPHANIE K. MUMMERT	Art Unit 1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-23 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-23 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's amendment filed on April 21, 2008 is acknowledged and has been entered. Claims 20 and 22 have been amended. Claims 1-19 and 24-31 have been canceled. Claims 20-23 are pending.

Claims 20-23 are discussed in this Office action.

Applicant's arguments, see p. 5-8, filed April 21, 2008, with respect to the rejection of Urdea has been fully considered and are persuasive. The grounds of rejection has been withdrawn.

All of the amendments and arguments have been thoroughly reviewed and considered but are not found persuasive for the reasons discussed below. Any rejection not reiterated in this action has been withdrawn as being obviated by the amendment of the claims. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

This action is made NON-FINAL to address the new grounds of rejection in view of Urdea and Erdogan.

Claim Rejections - 35 USC § 103

2. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Urdea et al. (US Patent 5,635,352; June 1997) in view of Erdogan et al. (Nucleic Acids Research, 2001, vol. 29, no. 7, e36, p. 1-7) and Harris et al. (US Patent 5,849,544; December 1998). Urdea teaches a method for nucleic acid detection and signal amplification to reduce background (Abstract).

With regard to claim 20, Urdea teaches a kit comprising a solid support selected from the group consisting of a solid support that comprises:

- a) a capture probe and one or more target capture probes linked to the solid support at the 3' terminus directly or with spacers, one or more target capture extenders with sequences complementary to a sequence on a target capture probe and a target nucleic acid molecule, and a discrimination extender with an unblocked 3' terminus that and a sequence complementary to a sequence on a capture probe and a target nucleic acid molecule (Figure 10, and col. 13, line 44 to col. 15, line 49, where capture probes are linked to the solid support, capture extender probes are complementary to a target and on the capture probe);
- b) a capture probe and one or more target capture probes linked to the solid support at the 5' terminus directly or with spacers, one or more target capture extenders with sequences complementary to a sequence on a target capture probe and a target nucleic acid molecule, and a discrimination extender with an phosphorylated 5' terminus and a sequence complementary to a sequence on a capture probe and a target nucleic acid molecule;
- c) a capture probe linked to the solid support at the 3' termini directly or with spacers, one or more target capture probes linked to the solid support at the 5' terminus directly or with spacers, one or more target capture extenders with sequences complementary to a sequence on a target

capture probe and a target nucleic acid molecule, and a discrimination extender with an unblocked 3' terminus and a sequence complementary to a sequence on a capture probe and a target nucleic acid molecule (Figure 10, and col. 13, line 44 to col. 15, line 49, where capture probes are linked to the solid support, capture extender probes are complementary to a target and on the capture probe).

With regard to claim 22, Urdea teaches a solid support selected from the group consisting of: a) a solid support comprising a discrimination probe linked to the solid support at the 5' termini directly or with spacers, one or more target capture probes linked to the solid support at the 5' terminus directly or with spacers, wherein a sequence of a target probe is complementary to a sequence on a target nucleic acid molecule and a sequence on the discrimination probe is complementary to a sequence on the target nucleic acid molecule (Figure 10, and col. 13, line 44 to col. 15, line 49, where capture probes are linked to the solid support, capture extender probes are complementary to a target and on the capture probe);

b) a solid support comprising a discrimination probe linked to the solid support at the 3' termini directly or with spacers, one or more target capture probes and linked to the solid support at the 3' terminus directly or with spacers, wherein a sequence of a target probe is complementary to a sequence on a target nucleic acid molecule and a sequence on the discrimination probe is complementary to a sequence on the target nucleic acid molecule (Figure 10, and col. 13, line 44 to col. 15, line 49, where capture probes are linked to the solid support, capture extender probes are complementary to a target and on the capture probe).

Regarding claims 20-23, Urdea does not teach that the discrimination probe is complementary to a single nucleotide polymorphism. Erdogan teaches a microarray comprising

allele specific primer sequences attached in discrete location for detection of single nucleotide polymorphisms (Abstract).

With regard to claim 21 and 23, Erdogan teaches an embodiment of claim 20 or 22, wherein the solid support comprises more than one different discrimination probe, each different discrimination probe spatially separated at identifiable locations and different discrimination extenders having termini complementary to a single nucleotide polymorphism position of an allele of different genes (p. 2, materials and methods, col. 1, where the allele specific primers/probes were attached to a microarray in discrete locations; Figure 1, where match and mismatch primers/probes differ at their free 3' end variable base, which is discriminated by the enzyme).

Regarding claims 20-23, neither Urdea or Soderlund specifically teach the element wherein the capture probes have terminal nucleotides that are blocked and/or unphosphorylated. Harris teaches the use of capture probes where the 3' end is blocked through immobilization while the 5' end is rendered incapable of ligation or extension via lack of a phosphoryl group or through blockage with a variety of 5' substituents (col. 5, line 46 to col. 6, line 5). Harris also teaches the reverse set up, where the capture probe is immobilized at the 5' end and blocked at the 3' end with suitable substituents to prevent reaction at the 3' end.

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to have applied the technique of detection of variable nucleotides as taught by Soderlund into the method of Urdea to arrive at the claimed invention with a reasonable expectation for success. Both Urdea and Erdogan are focused on the inclusion of a solid support for the detection of nucleic acids. As taught by Urdea, "the invention is useful in conjunction

with any number of assay formats wherein multiple hybridization steps are carried out to produce a detectable signal which correlates with the presence or quantity of a polynucleotide analyte” (col. 1, lines 39-43), while Erdogan teaches “oligonucleotide primers carrying polymorphic sites at their free 3’ end were covalently bound to glass slides” (Abstract). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have applied the allele specific probes/primers of Erdogan for detection of polymorphic nucleotides into the solid support of Urdea to arrive at the claimed invention with a reasonable expectation for success.

Furthermore, it would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to have modified the capture probes so that they were blocked or unphosphorylated to prevent extension of these primers during the extension or discrimination phase of the solid phase assay. As taught by Harris, “the capture probe is incapable of participation in the amplification stage. For example, it may be a capture oligodeoxynucleotide in which the 3' end is chemically bonded to the wall of the reaction vessel or bonded to solid phase material” (col. 5, lines 50-62). Therefore, it would have been obvious to employ methods known in the art to prevent primer extension or other reaction, including blocking terminal nucleotides or dephosphorylating nucleotides at the 5' end. While the method of Erdogan teaches the extension of the allele specific primers for detection of the polymorphic site, the instant invention is directed to the solid support itself and not the use of the solid support in a method. Therefore, it would have been prima facie obvious to one of ordinary skill in the art to have incorporated the allele specific probes of Erdogan, with the blocked termini of Harris into

the solid support of Urdea to arrive at the instant invention with a reasonable expectation for success.

Response to Arguments

Applicant's arguments with respect to claims 20-23 have been considered but are moot in view of the new ground(s) of rejection. The issues Applicant raised regarding Urdea has been addressed in the new ground of rejection stated above.

Conclusion

No claims are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHANIE K. MUMMERT whose telephone number is (571)272-8503. The examiner can normally be reached on M-F, 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on 571-272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Stephanie K. Mummert/
Patent Examiner, Art Unit 1637

SKM